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## **Technical Report**

AgentcitiesUK.net Challenge Day 2: e-Government and e-Democracy

Editor: Julian Padget

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# 1 Introduction

The second Challenge Day (CD2) of the AgentcitiesUK network took place at Sheffield Hallam University between 4-5 May 2005 and addressed the appropriateness for and application of agent technologies to the topical area of e-Government and e-Democracy in the UK

The meeting opened with introductions from Martin Beer and Julian Padget and a round table of the participants, outlining their interests:

**Nick Adams (NA):** e-government/e-democracy (Napier University)  
**Martin Beer (MB):** e-government, e-tourism, mobile agent technologies (SHU)  
**Tom Crick (TC):** compilers, logic programming, agents (University of Bath)  
**Paul Crowther (PC):** modelling, ontologies for agents, e-government/e-democracy (SHU)  
**Alessio Gugliotta (AG):** e-government portals, semantic web (Open University)  
**Chris Haynes (CH):** e-government, local authority access to services, service delivery (ODPM)  
**Richard Hill (RH):** agents and e-healthcare/e-learning (SHU)  
**Owen Lobb (OL):** distribution of multi-agent systems (SHU)  
**Tom McInerney (TM):** service delivery, local authority access to services, e-government (LGCSB, Eire)  
**Dejian Meng (DM):** web services/mobile commerce, agents (QMUL)  
**Daniel Osacar (DO):** e-government, service delivery, local authority access to services (LOCAL-RET, Spain)  
**Sascha Ossowski (SO):** AI, agents, coordination/communication mechanisms, e-commerce (Universidad Rey Juan Carlos, Madrid, Spain)  
**Simon Polovina (SP):** financial transaction modelling, agents (SHU)  
**Pep Lluís de la Rosa (PLR):** application of agents, knowledge gathering for services (Universitat de Girona, Spain)  
**M.Mercede Rovira (MMR):** e-government and e-services (City Government of Girona, Spain)  
**John Shaddock (JS):** e-government/e-democracy, service delivery, local authorities (Strategic Information Project, Hull and Humberside Assembly)  
**Dharmendra Shadija (DS):** web services/agent interfaces, e-learning(SHU)

The round-table and subsequent discussion highlighted that there was a relatively small group of participants who worked on agents and a much larger group who had come to the meeting because they were interested in learning about agent technologies as a potential solution to many of the e-'something' problems such as delivery problems, access to services, etc. It was also made clear there were very different perceptions of 'agents' and 'e-government' to different stakeholders. JAP gave a brief introduction to agents (see slides in figure 1), their properties and ways in which they have been used.

This was both punctuated with and followed by a lively discussion over a range of issues:

**Consistency:** CH would like consistency between interactions involving different local governments: could agent technology help? DO added that consistency between services was very much an issue for municipalities in Spain.

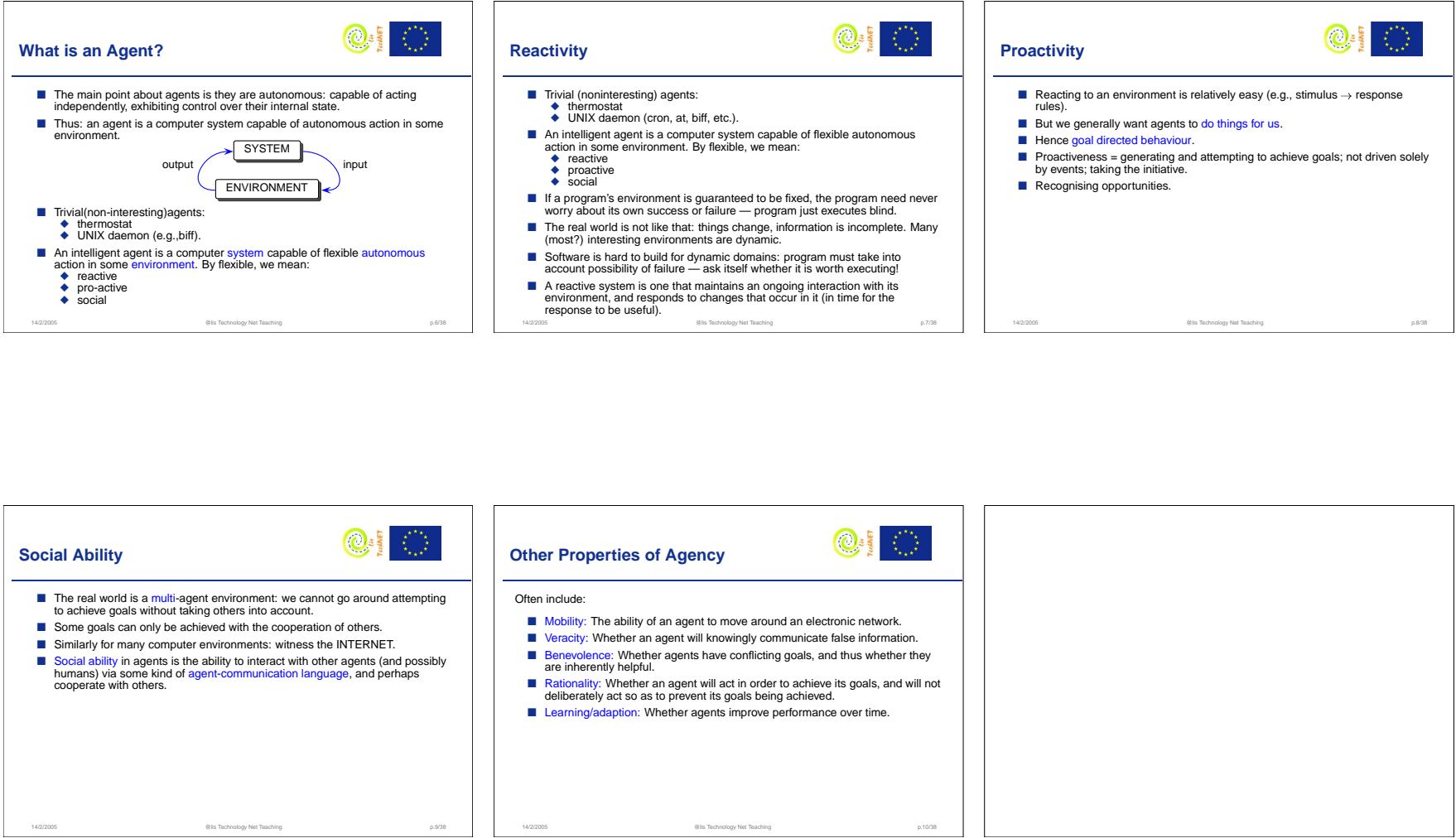
**Knowledge mapping:** problem of knowledge mapping between different stakeholders/users and subsequently the challenges inherent in 'multi-agency' interactions and associated issues.

**Data protection/privacy:** Issues of availability of data—data protection—and the delivery and robustness of services. How may the veracity of information be established? Demands proactivity on the part of the citizen, but the onus should be on the authority infrastructure to enable dissemination of information (DO).

**System integrity:** Local government responsibility (above) may be mitigated by misuse, e.g. multiple registrations for housing benefit, meaning you can fool the DVLA, commit a crime, etc (CH). How can the system be prevented from 'overdosing' on a false identity. Both goals and scenarios of systems need updating and clarifying at regular intervals.

**What is e-government?** the application of popular e-business/e-commerce ideas to government services (CH) E-democracy covers the 'softer' aspects of government such as voting, etc (CH).

Figure 1: Outline of agent characteristics



Need to address issues of inconsistent service delivery across multitude of local authorities. E-government is an opportunity to make the existing entrenched interactions more efficient—definitely NOT just about the Internet, but more about services delivery (DO).

**Citizen's expectations:** do they really care or want it, are they driving it? (TN) Positive experience from Ireland: motor tax renewal online, reminder posted with PIN, linked online to insurance companies, etc. Again, issue of multi-agency interaction. Local authorities spend 80citizens (CH). e-government needs to be narrowed down to effective deployment of government services, rather than being a catch-all term. Citizen expectations of e-government are being shaped by changes in business, e.g. Ryanair, Amazon, eBay.

**Citizens or customers?** People who receive most of the local authority services are least likely to have a settled lifestyle, or to access online services. 'Supermarket' approach to government - provide services cheaper, more customer-driven (JS). Interest in role of intelligent agents in decision-making and factors of issues relating to those decisions. How might government services be created in the future? Need to recognise gaps in existing services. Responding to events and changes in environments. But who is responsible and able to effect it?

**Trust:** If e-government is a big success, this means we can change and adapt government much more effectively and quickly (CH). Issue of trust: why are people happy to give a bank any information but are not prepared to give this same information to a local authority? Issues of demographics: who are more/less likely to give up information? e.g. many people are prepared to fill in a form for Tesco and give up personal information for a discount card, but why would it be politically insensitive to do the same for a local authority to give a small discount in council tax for the same information?

## 1.1 UK local e-gov project

CH gave a presentation on the UK local e-gov project with 675m of funding (see CD2 website for a copy of the slides).

- History and background of the project: 1980s saw central government disaffection with local government; late 1990s brought in the (New) Labour government modernisation agenda.
- Seven-stage process, including *pathfinder* projects. Issues: capacity, products, measuring progress; targets is that by end of 2005, 100% of councils should be operating as much as possible online. Currently in roll-out and looking after innovations, standards and future-proofing.
- Modernisation and improvement of councils and their services combined with improved quality, access and efficiency of services.
- Problems of access to services for people without access to relevant technologies (JS). How to market/sell e-government to citizens. Working with e-business and infrastructure. From an interaction point of view, huge potential for agent-based implementations.
- Funding still available for collaboration with local authorities, through Innovations stream. Limited shelf-life of e-government? Problems with good planning not necessary meaning good delivery. Government Connect project - joining up central and local government. <http://www.localgov.gov.uk>

Following this the participants moved into a small group discussion phase focusing on the following three topics:

1. Support for complex processes and citizens' interactions with government.
2. Privacy, security and trust, propagation of information.
3. Information delivery through profiles/capturing information from citizen/government interactions.

while in each case considering the strengths, weaknesses, threats and opportunities presented by intelligent agents in each of these scenarios.

## 2 Discussion Groups

### 2.1 Support for Complex Processes

The first stage of this group's discussion focused on establishing high level issues that would need to be addressed in determining the requirements – essentially a pre-requirements or meta-requirements phase:

- Constraints on information and resources
- Constraints on what can be done
- Groups must be identified to place parameters on system
- Environment must be identified
- How do we represent issues in the system?
- How is information presented?

In the second stage, the group intentionally went down to quite detailed concerns, that are not necessarily going to be applicable in all scenarios. This was motivated by a desire to have as free-ranging an exploration of the issues as possible without being constrained by level. Thus we find statements of general problems, particular scenarios, and views on both of these. The following observations were noted:

- Complex issues are more likely to arise with respect to a community rather than an individual citizen. They will have different goals and within each goal decide if it is an information-providing solution or an agent solution.
- Citizens discuss the proposed issues (chat forum?) then when consensus is reached the community agent then makes the proposal to the local government.
- Communities are dynamic “communities of interest”, not set geographical areas.
- Local government agent may need to be broker between the community and the services they need to interact with, such as planning, health + safety etc.
- A MAS could provide a manageable method of interacting with each citizen—something that is currently impossible. The system could distill the information in a manner that allows individual ideas to become productive local initiatives.

Then, expanding on the above, a number of opportunities and threats were identified, some sociological, some technical:

- What is the mechanism for managing the creation of a community? What technology must be provided?
- Need (to try) to sell the idea of greater interaction with local government to individuals to see if it is what is wanted and will be used.
- Can paper-based methods (posting letters) be evolved into a technical method (email etc.), responding to changing patterns of communication in society, while being mindful of digital divide issues?
- How do we evaluate services to find out if they are meeting the original requirements?
- How can we determine whether services are open to manipulation and hence corruption of the results they deliver?
- Who owns and maintains the agent system?
- Communities (of interest) may exist and want to take action for a very limited time each year
- The system should act as a mentor who enables citizen action, not as a guardian preventing action
- Agents could probe the citizen for more information about an issue to identify if it is a community issue via text SMS.
- Agents could provide a feedback framework to inform communities/citizens that action has been taken thus increasing community satisfaction and generating trust
- Mechanism is open to non-productive 'hatred' communities. Though legal they may have undesirable suggestions.
- How may the system be moderated: self-moderation, external moderation or citizen moderation?



## 2.2 Privacy Working Group

There is documented (through surveys) unwillingness of citizens to give information to local government that is readily supplied to other institutions, such as banks and many other organizations, typically through web forms. Two possible interrelated causes were proposed:

- Local government is the interface to many organizations, while a company is normally a single organization, so the use to which information may be put is assumed to be more apparent in the latter
- Likewise, the limits on the propagation of information are less clear for local government than with business (opt-in/opt-out clauses on forms notwithstanding)

The fundamental tension is that, in principle, better services are possible if more (personal) information is available *and* if that information is made available to multiple agencies within local government. The idea of giving information once is attractive both to individuals—who get fed up with filling in forms with the same data—and agencies. The challenge is how to monitor and authorize whither it is communicated. It would be tiresome that each request for information be checked and authorized by the citizen. There are also circumstances in which it may be undesirable that the citizen know about a request, such as enquiries from the police (whether this is right or not is outside the scope of this discussion: it is just an example to illustrate the case).

In the context of multiple electronic agencies, it would be quite practical to operate the principle of least disclosure, only communicating the minimal amount of information to a given agency about a particular citizen. However, the relative privacy is largely illusory if data from different agencies can subsequently be pooled to reconstruct the whole, which in turn depends on how freely data may be transferred between agencies within local government. Restrictions on flow are probably however only minor delays rather than actual barriers to construction of the whole record.

From the citizen's point of view of their privacy, the problem is that once information has been given out, it is very hard, if not impossible, to control where it goes or how it is used. The situation is no different in principle from a purely paper-based world, it is just that electronic information propagation is simpler and hence much more rapid. One potential solution was identified, borrowing from an approach to medical data management, where a secure virtual organization is instantiated on demand, within which agents may manipulate sensitive data, but from which they may only export aggregated results (the objective being to ensure patient anonymity). A similar approach might be adapted to allow agency queries, but which does not reveal precise personal data. For example, queries might be phrased not in terms of specific data requests (for subsequent analysis), but instead in terms of the analysis itself, so instead of asking (for a benefit claim process, for example) for the applicant's address, it might ask whether the address satisfies some condition (that had better not involve equality!).

A perceived inhibitor in C2G/G2C interaction, especially at local level, is a lack of trust. This can probably be remedied quite rapidly by giving concrete responses to requests for action and creating transparency in transaction (external and internal), enabling the tracking of the usage of data, and in authentication and authorization. It was argued that such audit trails belong to the data subject, but it is not clear whether government would take the same view.

A delicate question, at this time in the UK, is how close a personal agent might be to an identity card and what risks there are for identity theft arising from this approach. There was no resolution on this issue.

## 2.3 Targeting Information Delivery

People are familiar with junk mail and a somewhat smaller percentage of the population are finding spam possibly even more frustrating because of the quantity. Irrelevant emails tend to reflect on the credibility of the sender, such that subsequent emails have a greater chance of going unread, even though content may be more relevant. The idea of delivering only relevant information is probably impossible to achieve, furthermore relevance is not a simple two point domain, but for the most part could be conceived of as continuous measure until some cut-off is reached when it drops to zero. The

challenge for the information provider is how to retain the trust of the receiver so that they continue to subscribe and to read the information sent by email to them. Recent work in trust and social networks could help here, as too could the use of a more general newsletter covering a number of topics, targeted at communities or networks, using networks of profiles rather than individual information. This would essentially allow statistics and aggregations of data to do their work.

The group summarized the aim as tailored, matched and improved services, leading to redesign of local government services, rather than introducing computers into processes and calling it e-'something'.

Thus it was that the following issues were identified as the basis for further work:

**Legal issues:** These fall into two broad categories: access to information and the legal status of agents.

- Data protection? Access to information. Civil liberties.
- Registration of information and fields stored under Data Protection Act, what they are used for and who has access.
- Legal standing of agent's actions?

**Utility issues:** Broad range of topics covering trust, adaptation, individual versus group interaction.

- Group profiles – according to demographics, location, institutions, etc., but perhaps more novel self-defined or emergent characteristics could be used in time
- Storage of citizen profiles – who would it benefit? Citizen, politician, or who? What policies would satisfy the various stakeholders? What (meta-)policies would be acceptable for the evolution of policies.
- Feedback – how can you identify the strengths and weaknesses in order to improve. Also, how do you measure the success of the agent?
- Identifying and profiling the common interactions between a citizen and governmental organisations – a means to identify the information that is needed.
- Problems of information gathering – very subjective and emotional! Time consuming.
- Foresee two broad categorizations in the application of agents: self-service agents and assisted-service agents.
- Key question: what information does the government want and what do the citizens want?
- How to address problem of mistrust of government's intentions? Why do people trust Tesco, banks, etc. more than their own elected (local) government?
- Existing groups that already interact with local government e.g. engineers, businesses, etc.

**Technical issues:** Largely self-explanatory and almost certainly incomplete!

- Mammoth task of storage of a huge amount of individual profiles and its proper curation.
- Techniques and technologies that are available and appropriate e.g. data mining, agents.
- Reasoning/planning with imperfect information – adaptive intelligent agents rather than procedural reactive solutions.
- Associated problems of assigning 'data to a face'.
- Post-decision validation processes: using this information, how can decisions be reversed or checked? e.g. our agent made this decision, but is it right?
- Mobility of agents e.g. moving from one building to another, how would you get a wireless connection to work? You have an agent, the building has an agent? Agent communication languages? Standards.
- Defining boundaries for such a project. Verification and validation of success of agent - matching to the initial requirements?

### 3 Use cases

In the final stage of the meeting, the groups came back together to bring the perspectives of the different discussions to the creation and consideration of two scenarios centred on complex processes in citizen interactions with government but illustrating aspects both of privacy and the targeting of information delivery.

### 3.1 Support for Complex Processes

Following the discussion in section 2.1 the focus was initially on methodology and various practical issues involving the engagement and interaction of citizen, community and local government.

- Identify the major stakeholders in the system and than range of services involved.
- The notion of ‘community’ and it having a role in the process
- Two stances on community: physical/environmental sense and people working together who share an interest.
- A citizen can put forward a view, a community can put forward a collective view. The power of the community voice. improving engagement with the system, invariably people who most require the interaction are in a poor position to receive it.
- Got to the stage of identifying ‘agents’ in a model, but not whether they were software or human agents.
- Reiterated idea of trying to ‘sell’ notion of agents to the e-community (RH).
- Norms and restrictions on the types of services (SO).
- Discussion of the Digital Inclusion agenda e.g. IT equipment for voluntary groups, local government support, on-going maintenance/support, etc (NA).
- Provision of ICT support for voluntary groups (JS): After initial delivery of hardware and software, that’s generally it! System is in place for procurement of kit, but very little support.
- Dial-a-Ride services, very dependent on volunteers, limited resources.

Following this discussion, attention turned to fleshing out two use cases that captured different aspects of citizen (community) interaction with local government. The first scenario identifies issues in relation to making changes to traffic regulations, while the second examines a planning application.

### 3.2 Scenario: traffic changes

The scenario considers the revision of the traffic regulations in respect of a residential street to make it one-way with traffic calming:

- Stakeholders: citizens and different communities, planning authorities, traffic agency, local businesses. Large number of stakeholders for such a simple issue e.g. emergency services, waste management, public transport providers. Traffic flow is only one concern in reality.
- Would the planning agency have a checklist for contacting stakeholders? Therefore, a planning agent would have to know who needs to be contacted.
- The planning management process is relatively opaque from the citizens’ perspective, so it is hard for them to get involved in the process. Agent involvement could play a part in ensuring that the stakeholders get involved early in the planning process.
- Would technology help in this situation? Many current methods of notification for planning issues are overlooked or ignored - would text messages or email help? Also, it’s unlikely that the local authority would be keen to organise opposition to what they want to get done!
- Could agents help to form a community? Becoming part of a group, being able to interact and influence decisions would be very constructive. A sense of belonging to a group and knowing that other people care about an issue strengthens local community. Should enable the elaboration of representative response from the community.
- How can the dialogue be ‘validated’?
- It is important that the model is not just reactive e.g. ‘I object to this one-way road’ – it should also enable people to request such changes.

### 3.3 Scenario: planning application

The scenario considers planning applications in general, identifying a range of pertinent issues, such as:

- Urbanisation of semi-rural areas e.g. knocking down large houses and building flats, may change the demographics of the area.
- Re-zoning of land for business or residential use.

- Problems of getting community engaged in planning process, rather than just developers, planners and council.
- A patch of land where the different stakeholders have very different ideas for the use e.g. community want a park or playing fields, developers want a new shopping village, council want more houses, etc.
- A shared 'community of interest' exists in the abstract, but how can it be made concrete, getting people to identify with it, and subsequently getting it involved in the process.
- Problems of regional strategy for planning possibly being in conflict with local planning strategy e.g. Regional Development Agencies.

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